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Published in:
Journal of Risk Research

DOI (link to publication from Publisher):
[10.1080/13669877.2016.1178660](https://doi.org/10.1080/13669877.2016.1178660)

Publication date:
2017

Document Version
Accepted author manuscript, peer reviewed version

[Link to publication from Aalborg University](#)

Citation for published version (APA):
Larsen, S. V. (2017). The challenges of risk society for impact assessment. *Journal of Risk Research*, 20(11), 1439-1449. <https://doi.org/10.1080/13669877.2016.1178660>

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The challenges of risk society for impact assessment

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Abstract:

This paper takes its point of departure in Ulrich Beck's theory of risk society and the aspects that characterise this society. The paper puts forward a hypothesis, on which theoretical challenges the characteristics of risk society pose to impact assessment as a decision support tool; namely the challenge of delivering assessments and predictions and the challenge of handling differences of opinion and debate. Through a case example of integration of climate change in strategic environmental assessment, the paper uses empirical evidence from a survey and a series of interviews to carry out a preliminary discussion of how the theoretical challenges are reflected in practice. The case study results show that the challenge of delivering assessments and predictions in a risk society is reflected in the current state of practice, while the challenge of handling differences of opinion and debate is not clearly reflected.

Key words: Risk, risk society, impact assessment, strategic environmental assessment

1 Introduction to risk society and impact assessment

A theoretical framework based on the macro sociological theories on risk by Ulrich Beck is applied throughout this paper. The theoretical framework is mainly based on his publication *Risk Society: Towards a New Modernity*, originally from 1989 and later translated into English. In the field of sociology, Beck's theory is very influential and has been referred to as highly original and innovative. It has been said to have grown '*increasingly prevalent and popular in the social sciences*' (Sørensen and Christiansen 2013, 12). Although Beck's work can be criticised and discussed, it remains one of the most detailed accounts of the risk environment in contemporary society (see e.g. Elliott 2002; Lupton 2006). With other influential sociologists such as Mary Douglas, Ulrich Beck views risk as socially embedded, and to some extent socially constructed (Lupton 2006), which has been discussed by various other sociologists, among these Anthony Giddens (Hinchcliffe 1997; Nielsen et al. 1999). The theory of risk society has been applied in various fields of research, including environment and planning, and it has often been applied in analyses of specific situations or cases and discussed how and to what degree the theory is reflected empirically (see e.g. Matten 2004; Gow and Leahy 2005; Cebulla 2007; Olofsson and Öhman 2007; Drake 2011; Larsen 2011; Howell 2012).

However, so far the theory of risk society has not been discussed directly in relation to the tools of impact assessment.

The aspects of risk society as unfolded by Ulrich Beck are many, but for the purpose of this paper, focus is on three aspects: The emergence of a new type of risks with distinct characteristics, the changing role of science and knowledge and the changes in politics and decision-making in this risk society. The framework is based mainly on Ulrich Beck's original thesis on risk society and his book *Risk Society: Towards a New Modernity*.

Turning to impact assessment, this concept covers a range of tools used worldwide to identify, predict, assess and mitigate impacts of new developments on environment and people (Senecal et al. 1999). Inherently, impact assessment is about the future and how to deal with future risks or impacts in a proactive way. The purpose of the tools is to provide information to the decision-making process, assess and mitigate negative impacts, contribute to a sustainable development, as well as ensure transparency in decision-making regarding environmental issues. (Kørnøv 2007; Glasson, Therivel and Chadwick 2005) Two prominent impact assessment tools are Strategic Environmental Assessment (SEA); focussing on plans and programmes, and Environmental Impact Assessment (EIA); focussed on projects.

In broad terms, risk can be defined as '*a danger with an uncertain outcome*' (Bang et al. 1999, 831) or as '*a threatening possibility*' (Beck 1992, 52), thus as an uncertain negative future effect. In impact assessment, possible future environmental impacts are identified and assessed; risks are evaluated through analyses of which impacts might be associated with a specific development. In this interpretation, society-level changes, such as those changes proposed by Ulrich Beck, in the characteristics and dynamics related to risk, could influence and challenge the practice of impact assessment.

This paper seeks to fuse the theory of risk society with knowledge and conceptualisations of impact assessment to form a hypothesis seeking to answer the question: *What challenges does risk society pose for the practice of impact assessment?* This question has a practical purpose of uncovering challenges for carrying out impact assessment. Further the paper presents a preliminary theoretical discussion of whether and how these challenges are actually reflected in practice. The discussion is based on a contemporary example of working with climate change in SEA in Danish municipalities.

2 Overall approach and methodology

Overall, this paper takes a deductive approach. This is based on a definition of deduction as an approach, which takes its point of departure in a general rule or theory, which is tested in order to determine if it applies to separate cases (Alvesson and Skjöldberg 1994). In section 3, part of the theory of risk society is presented, and in section 4 this is coupled with knowledge of impact assessment, to hypothesise on the challenges posed by risk society to the practice of impact assessment. In section 5, a preliminary test of the hypothesis is carried out through a discussion of whether the proposed challenges are reflected in the case of integration of the new risk climate change in SEA. The overall approach is illustrated in figure 1.

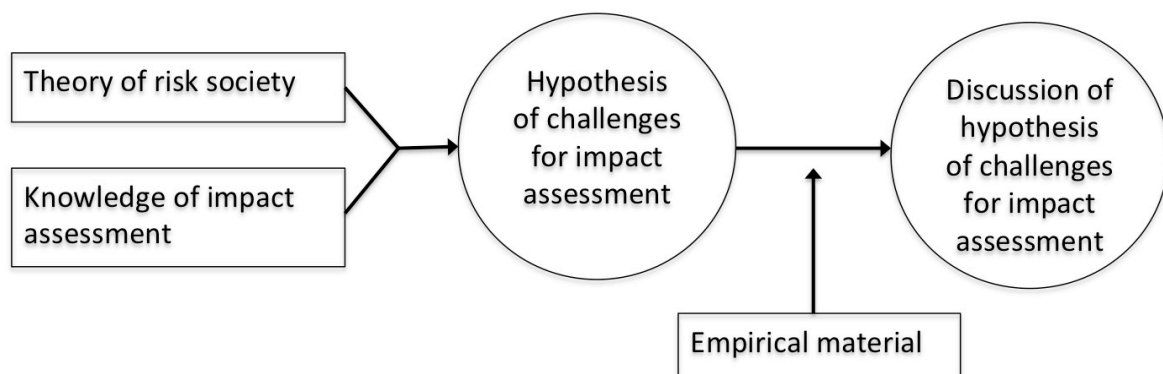


Figure 1 Overall approach applied in the paper

The empirical material applied to discuss the hypothesis in section 5 consists of different sources of knowledge on whether the hypothetical challenges are perceived as actual challenges of integrating climate change in SEA in Danish municipalities. As local planning authorities, the 98 municipalities in Denmark conduct a large part of Danish impact assessments and the majority of SEAs. They are thus deemed a relevant point of entry to the discussion. The specific material used is:

- A set of in-depth interviews carried out in 2010 with representatives from six Danish municipalities. The interviews were focussed on the SEA of municipal plans (a comprehensive spatial plan) from 2009, where all the selected municipalities worked with climate change to varying degrees. The included municipalities were Egedal, Hillerød, Ringsted, and Roskilde on Sealand, and Aalborg and Favrskov in Jutland, representing both urban as well as rural municipalities. The interviewees were employees responsible for conducting the SEA of the municipal plans.
- A survey conducted in 2009 among all of the 98 Danish municipalities, with a total of 58 respondents from 50 municipalities. Among other things, the survey focussed on which challenges the municipalities expected, if they were to work

with climate change in the river basin management plans with SEAs they were preparing at the time.

3 Theoretical framework: Ulrich Beck's risk society

Ulrich Beck's theory is in this paper viewed mainly as descriptive, focussed on describing how society is in a transition to what he terms risk society. In risk society, the efforts of industrial society to control dangers through science and technology lead to the creation of a new form of risks for society (Beck 1992). For instance, nuclear energy is one of the great technological breakthroughs, but it has also turned out to be high-risk regarding the operation as well as the handling of waste.

Beck argues that risks in risk society are different from the risks and dangers that previously characterised society. The new risks transgress former categories of time and space, where they were formerly limited to specific groups, places and times. For example, nuclear accidents affect people within a very large radius and also future generations. The new risks are complex and non-transparent causal mechanisms. Part of the complexity is that there, as described, are many actors involved, who are separated in time and space. Another characteristic of risks in the risk society is that they cannot be directly observed: *'many of the newer risks (nuclear or chemical contaminations, pollutants in foodstuffs, deceases of civilisation) completely escape human powers of direct perception'* (Beck 1992, 27). Thus Beck defines risk as second-hand non-experience, partly because knowledge of risk is not based on specific experience, and partly because knowledge of risk is external and comes from science. Thus society is dependent on science to obtain knowledge and evidence about risk. (Beck 1992; Willms and Beck 2002)

Another characteristic of risk society is that science is increasingly confronted with the consequences of its own enterprise and success: *'they are targeted not only as a source of solutions to problems, but also as a cause of problems'* (Beck 1992, 156). At the same time, science has problems in delivering certainty and knowledge regarding risks. Thus, it is legitimate that there is more than one perception of whether or not a certain risk is significant. According to Beck (1992, 29) this means *'the sciences' monopoly on rationality is broken'*. Risk is thus no longer defined solely by science; rather it is affected by *'competing and conflicting claims, interests and viewpoints of the various agents of modernity and affected groups, which are forced together in defining risks'* (Beck 1992, 29). In summary, science according to Beck (1992, 166) has become both *'indispensable to and incapable of truth'*. A problematic paradox exists because society is very much

dependent on science in relation to risk at a time where science is increasingly incapable of offering the required assistance, and the public becomes increasingly critical. (Beck 1992)

These issues creates space for societal processes of definition, and thus for the broad public to get involved in risk definition. Risk definitions are for instance clarifications of the causality behind risk, and thus what and who causes risk, and what should be done. For example, in relation to forest decline due to acid rain, some will define motoring as the cause, whereas others will define power plants as the cause, depending on their own interest. According to Beck, the utilisation of objective natural science, regardless of it's failing status, is not enough in the processes of risk definition, because '*it ignores the significance of cultural perceptions and intercultural conflict and dialogue*' (Beck 1996, 3). Given the '*competing and conflicting demands, interests and viewpoints*' there are many different perceptions of, for instance, what represents a significant risk, and which risks we are willing to accept to gain an advantage (Beck 1992). According to Beck science cannot answer these questions: '*All kinds of experts can never answer the question: How do we want to live?*' (Beck 1996, 4). (Beck 1992; Willms and Beck 2002)

In risk society, these processes of definition increasingly take place outside the formal democratic political frames and are instead handled in more informal arenas with the participation of e.g. businesses and the public. In this way, the political sphere is expanded to what Beck terms the sub-political. According to Beck, the term sub-politics refers to '*politics outside and beyond the representative institutions in the political systems of nation states*' and therefore means direct individual participation in political decision-making, rather than solely representative democracy (Beck 1996, 18). Sub-politics can for example result in more influence for public movements, organisations, lobbyists, experts and public officials, who advocate their version of how they want to live. (Beck 1992)

4 Hypothesis: Challenges for impact assessment in a risk society

The overall hypothesis for this paper is that a transition to risk society will entail that some of the risks assessed in impact assessment can be characterised as 'new risks', which pervade risk society. This change in turn brings certain challenges to the forefront. Figure 2 sums up the presented theory of Beck's risk society and adds (in the two boxes to the far right) a hypothesis of two challenges that risk society entails for impact assessment.

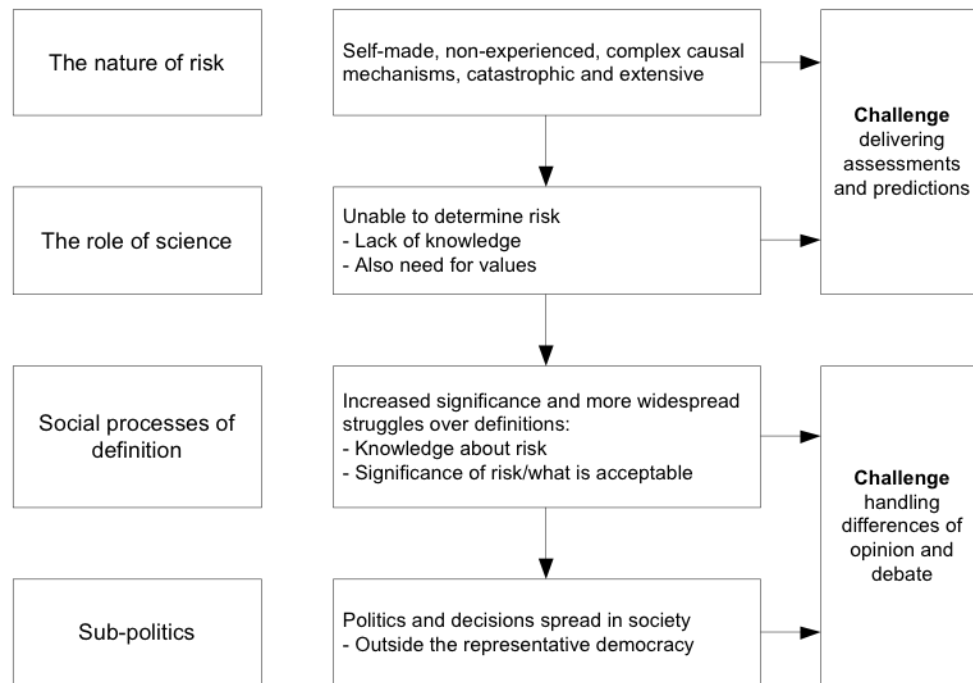


Figure 2 Summary and hypothesis of challenges

As described in the introduction, impact assessment is about identifying, predicting, evaluating and mitigating effects (Senecal et al. 1999). This is done based on comprehensive and systematic analysis, and using both qualitative and quantitative tools, such as modelling of impacts and network analysis (Kørnøv 2007). According to the International Association for Impact Assessment (IAIA) principles for best practice of environmental impact assessment, the assessment should among other things be ‘rigorous’, meaning that *‘the process should apply “best practicable” science, employing methodologies and techniques appropriate to address the problems being investigated’* (Senécal et al. 1999, 3). As can be seen from figure 2, Beck proposes a range of characteristics of risk in risk society, with a focus on e.g. uncertainty and complexity, an inability of science to determine risk, due to a lack of knowledge. In the light of this, it is argued that risk society makes it increasingly challenging for impact assessment professionals to deliver rigorous and science-based predictions and assessments, using the current standards and methods.

As stated by Kørnøv (2007, 345), and indicated in the introduction, impact assessment *‘is based upon both scientific and political grounds for decision making, through technical analysis and through public participation’*. This highlights that impact assessment is not only based on science and knowledge, but also on participation, debate and values. The IAIA principles state that environmental impact assessment should also be ‘participative’,

meaning that it should *‘provide appropriate opportunities to inform and involve the interested and affected public, and their inputs and concerns should be addressed explicitly in the documentation and decision making’* (Senécal et al. 1999, 3). Figure 2 summarises how risk society is characterised by emphasis on struggles over definitions of risk, both in terms of knowledge and more value-based judgements, as well as a spread of politics and decisions in society as sub-politics emerge. Theoretically, in relation to impact assessment, this means that the public will increasingly hold an opinion on the assessed development as well as the assessment, and that there will be increasing differences of opinion. This entails a challenge for SEA practitioners, who need to handle emerging differences of opinion and debate in the assessment process, both in terms of providing opportunities for participation and addressing the different opinions in the documentation and decision making process. The relevance of the challenge of whether and how to deal with values is supported in literature on impact assessment. For example Richardson (2005, 348), states that strategic environmental assessment is inherently value-laden and that *‘one of the issues that the EA community must sort out is how it deals with the presence of multiple and often conflicting values and ways of valuing’*.

In the following section, the reflection on these challenges in the present case of climate change in strategic environmental assessment is discussed.

5 Challenges in practice: Climate change in strategic environmental assessment

According to numerous sources, climate change is one of the major challenges facing modern society. The continuous emissions of greenhouse gasses risk causing a changing climate with global consequences such as sea-level rise and drought (Bernstein et al. 2007). Based on the following characteristics of climate change, this paper views climate change as an example of the new risks that Beck proposes. (see e.g. Bernstein et al. 2007; Willows and Connell 2003):

- Climate change is arguably self-inflicted.
- Climate change is, at least to a certain extent, not detectable to our senses and has long time horizons before it will materialise. For example the Intergovernmental Panel on Climate Change works with a time horizon of 2100 in its assessments.
- Climate change impacts are global.
- Uncertainty and complexity are connected to climate change impacts and their predictions.

Through the last decade, there has been discussion, analysis, and guidance published on whether and how the challenge of climate change should be handled in impact assessment

(see e.g. Agrawala et al. 2012; Wilson 2010; Larsen 2014; McGuin et al 2013a and McGuin et al 2013b). It has been suggested that climate change should be integrated into impact assessment through three approaches (Larsen and Kørnøv 2009):

- Mitigation: assessment of greenhouse gas emissions, and how these may be reduced
- Adaptation: the impacts of climate change on the policy, plan or project and how this might be adapted to climate change
- Baseline adaptation: the impacts of climate change on the environmental baseline for the assessment, and how these might influence targets and assessments.

Despite these approaches, there are indications that climate change is not currently sufficiently integrated in impact assessment practice. In a study by Larsen, Kørnøv and Wejs (2012) it was found that climate change is mentioned in 58% of 149 SEA reports, and that mitigation is the main issue addressed, while adaptation and baseline adaptation are not addressed in SEA reports. Internationally, a study prepared for the European Commission points out that in SEA '*specific attention to climate change issues appears still to be limited in many Member States*' (COWI 2009, 116). In EIA, a study published by Larsen (2014) indicates a larger emphasis on integration of climate change. Here, 18 out of 19 studied EIA statements integrated climate change, although, as was the case for SEA, the primary focus is on mitigation, since none of the statements mention climate change adaptation or baseline adaptation (Larsen 2014). Likewise, Agrawala et al. (2012) point out the lack of actual implementation of climate change adaptation in EIA in practice. These results could give cause to question what role the theoretical challenges posed in this paper could play in the lack of integration of climate change in impact assessment. For the purpose and simplicity of this paper, focus is on SEA and climate change in Denmark.

Challenge of delivering predictions and assessments

In the survey conducted, the respondents were asked what they deemed the most important challenges on working with climate change. 45% of the respondents pointed at the complexity and non-transparency of climate change, while 33% of the respondents pointed to long time horizons, 35% to lack of unequivocal answers and 29% to lack of scientific knowledge. These are all results that underpin the relevance of the challenges in practice.

The challenge of delivering predictions and assessments, is also supported by the interviewees. Five of the six interviewees point to uncertainty and complexity as a challenge to working with climate change in SEA. Especially in relation to climate change adaptation, they point to uncertainty regarding the specific local climate change impacts,

and thus uncertainty about what to adapt to. As the interviewee from Roskilde Municipality states *‘there are still a lot of uncertainties about the basis. For example sea level rises, which model are we to base ourselves on?’* The interviewee from Aalborg adds that climate change as an issue is difficult to relate to as it is not very concrete. At the same time she points to the fact that there are multiple scenarios to deal with, and in some of these scenarios the consequences are possibly quite severe. Scenarios are mentioned by three of the municipalities. They express the challenge of dealing with multiple scenarios for development or choosing one scenario. In Egedal Municipality they have experienced internal differences of opinion about which scenario to use, and now request a clear statement from the national authorities on which scenarios to use. Two of the interviewees express climate change as challenging because it is an emerging issue on the agenda, as the interviewee from Roskilde states, *‘it is new. Especially adaptation since focus so far has been on CO₂’*.

These results support the hypothesis of the challenge of delivering predictions and assessments when dealing with new risks, especially in relation to adaptation to climate change. SEA could be seen to exemplify the role of science that Beck describes as *“indispensable to and incapable of truth”* (Beck 1992, 166), since its predictions and assessments are traditionally based on scientific analysis and knowledge, an approach that may no longer be feasible.

Challenge of handling differences of opinion and debate

Only 3% of the survey respondents point at debate and difference of opinion as an important challenge in working with climate change. This result is also reflected in the interviews. The respondents from the municipality of Aalborg state about climate change that *‘there has not been much focus on it [externally], it drowns a bit in all the other issues in the municipal plan’*. In Egedal Municipality, the experience has been similar since the respondent states that, *‘there are incredibly few citizens that have an opinion, but those that have are completely in line with the need to consider climate change’*. This points towards low public interest, and no debate to pose a challenge to the SEA work. This is also underpinned by the survey results where 29% of the respondents agreed that the fact that focus had been on other issues was a barrier to working with climate change. However, in Roskilde and Favrskov municipalities, and to some extent in Egedal municipality (as described above), the public and politicians have expressed a positive attitude towards working with climate change, and thus put pressure on the municipality to deal with it. This is perceived by the respondents as positive, and a support which has been taken into consideration, rather than a challenge to the climate change work.

Only in Egedal the challenge has had some resonance. Here, there have been disagreements internally within the organisation and among the politicians concerning which scenario to use as a point of departure for working with climate change adaptation, as also mentioned above. The disagreements were settled through a seminar with external experts, where a consensus was reached. This underlines the point that when dealing with new risks, something that could be perceived as a fact - in this case the future development of climate change - is open for discussion, interpretation and competing knowledge claims, as pointed out by Beck (see section 3).

These results do not fully support the hypothesis of the challenge of handling differences of opinion and debate when dealing with new risks, in the case of climate change in SEA.

6 Conclusion and discussion

On the basis of Ulrich Beck's theory of risk society a hypothesis is formed that the characteristics of risk in the risk society coupled with the nature of impact assessment tools lead to two main challenges for impact assessment in a risk society. These are:

- Delivering assessments and predictions, due to the nature of the new risks and the role of science in risk society
- Handling differences of opinion and debate, due to the new social processes of definition

When reviewing the case of practical experiences in Danish municipalities working with climate change in SEA, it appears that mainly the first challenge is reflected in practice. The respondents from the municipalities either have not experienced differences of opinion and debate, or do not consider it a challenge. Also, it appears that the first challenge is more dominant, when dealing with climate change adaptation rather than mitigation. There could be many different explanations for these results.

When trying to understand why climate change adaptation seems less challenging than climate change mitigation, one issue is that adaptation is further down the causal chain. Beck describes how the causal chain is difficult to determine, and thus the consequences of and need for adaptation would be more uncertain than for mitigation, making it more challenging in terms of delivering assessments and predictions.

The lack of resonance of the second challenge could be related to the impact category climate change – that there is not much debate about and focus on climate change. Climate

change as an issue has been pointed out as one, which does not necessarily draw a lot of public response because of its fairly vague and incomprehensible nature, and because the public is more concerned about other issues (see for example Giddens 2009). This is also suggested in the interviews in section 5. This warrants a debate about whether the thesis of Beck about struggles over definitions and subpolitics (cf. figure 1) is valid at least in this specific case of climate change even though, as described in section 5, climate change has many of the characteristics of a risk in risk society. Possibly the situation will change as the consequences of climate change begin to unfold, as suggested by the interviewee from Ringsted Municipality '*climate change will become more and more integrated the more actual changes we see*'.

Another possible source of explanation could be that this study has focussed attention on the impact assessment of a plan, policy or project, and not directly on the plan, policy or project itself. Perhaps debates and differences of opinion are raised in relation to the plan, policy or project later in the decision-making or implementation process, rather than in relation to the SEA. Interestingly, another case of SEA of a seemingly risk-related plan researched by Kørnøv et al (2014); the SEA for creating a nuclear waste disposal facility in Denmark, has sparked much and heated debate. This contradicts the argument above. One final comment is that the plans, which the interviews relate to, are comprehensive spatial plans, which do not necessarily spark much initial debate because of their overall and unspecific nature.

Overall, the material and discussions in this paper confirm Beck's thesis of risk society concerning the role of science and knowledge. At the same time, it does not unequivocally underpin the parts of the thesis concerned with societal definition processes. Climate change seems a good candidate for an issue that would spark such processes, but it does not in this specific case. Some of the explanations for the results seem to centre on degrees of uncertainty, and the specifics context of the issue. This does not provide grounds for dismissing Beck's theory, but further clarifying and specifying the processes of societal definition processes in risk society. Regarding the practice of impact assessment, the results underpin uncertainty as an important challenge for carrying out SEA. This challenge is not well recognised in research and practice, and practice of handling uncertainty in impact assessment is weak (Larsen, Kørnøv and Driscoll 2013). This calls for examining the role of uncertainty in impact assessment in research and development of impact assessment practice.

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